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3D virtual geology field trips: opportunities and limitations

Conference or Workshop Item

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3D Virtual Geology Field Trip

Tom Argles, Brian Richardson, Sarah-Jane Davies, Shailey Minocha and Nick Braithwaite

Setting the scene



- Welcome
- Introductions (project team)
- Wolfson Open Science Lab (portal)
- 3D virtual Geology trip App (background)
 - real field trips + DVD
 - Second Life experiences

Second Life: a 'social' world

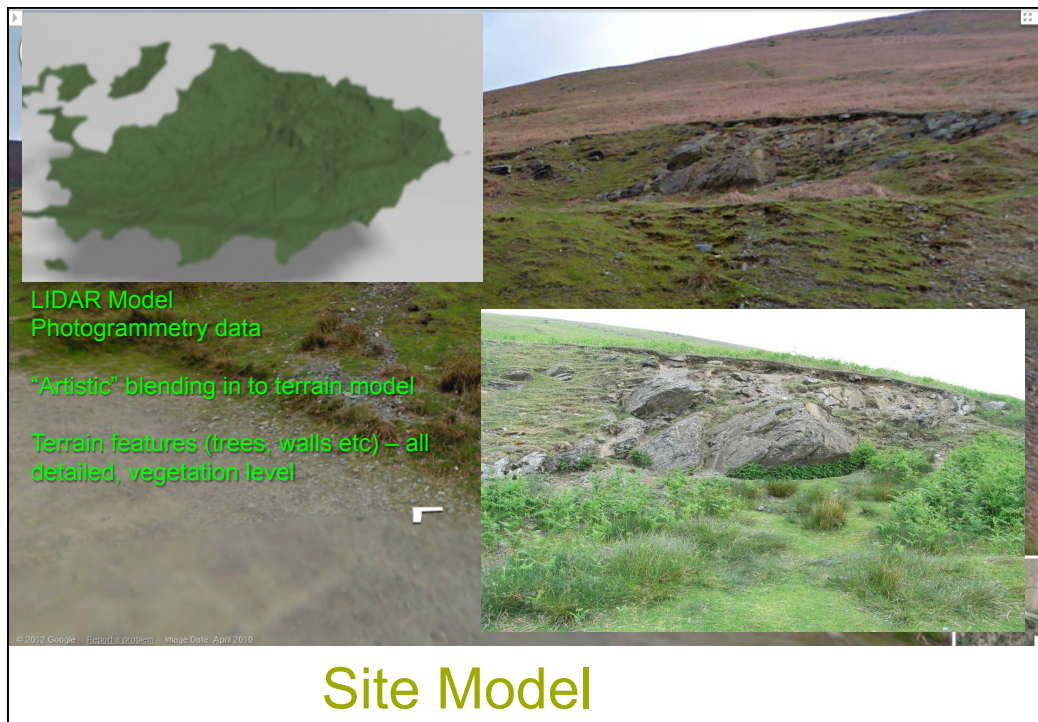


- an immersive experience
- sense of space
- sense of presence, co-presence
- spatial perception of sounds
- feeling of 'flow' and sense of engagement
- collaborative and contextual learning

Novel features of the 3D App



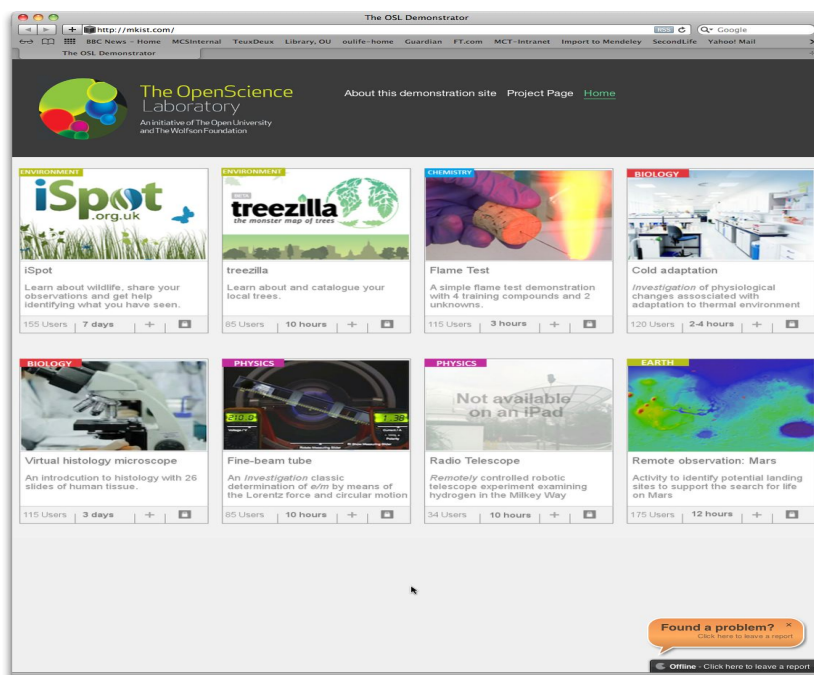
- 3D virtual Geology trip App
 - developed in Unity 3D
 - non-realism (e.g. drape maps over the terrain)
 - realism (design/representation), pedagogy)



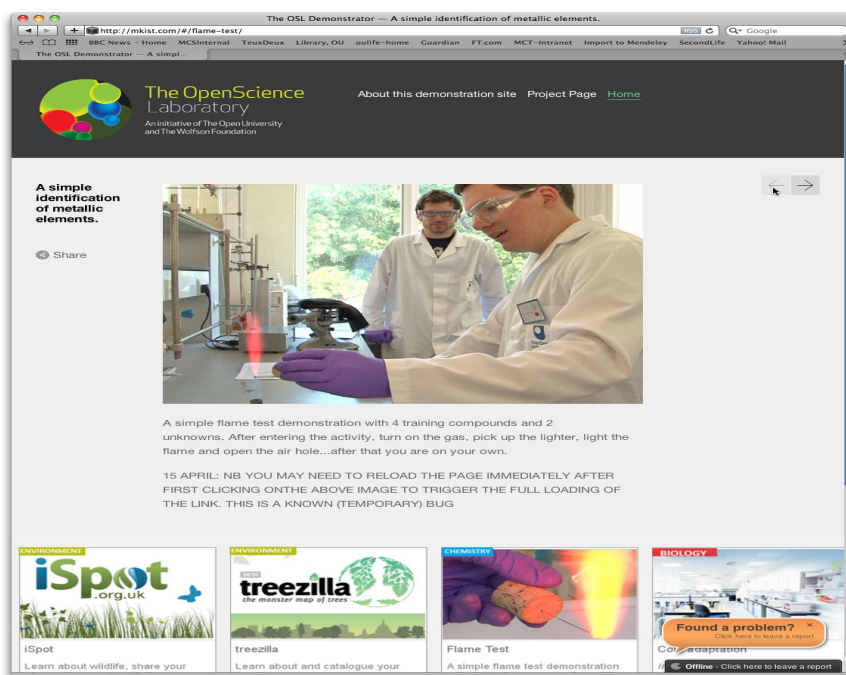
Workshop plan



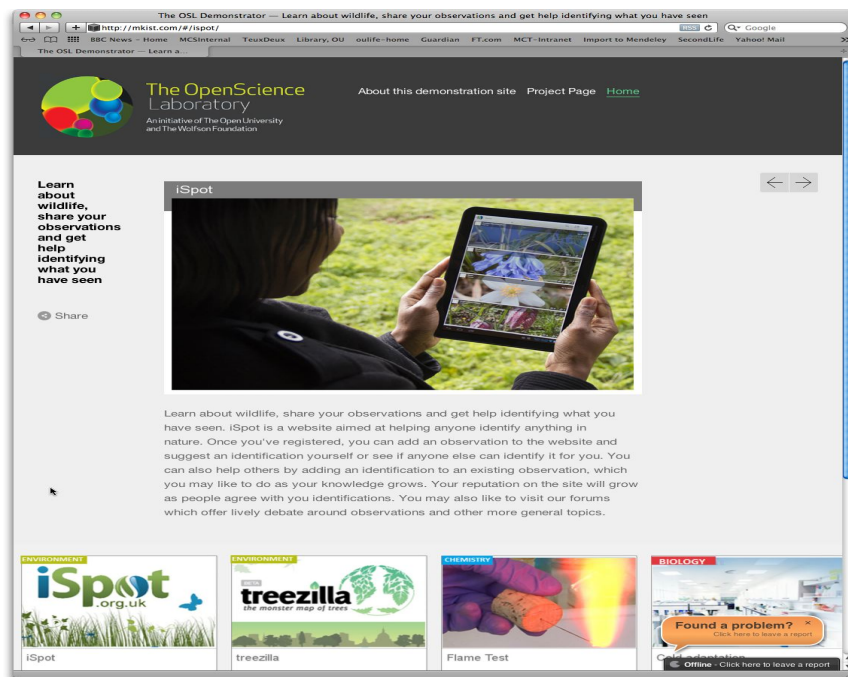
- Plan for the workshop
 - Demo and 5 minutes discussion
 - Opportunities and limitations (15 + 5)
 - Challenges (15 + 5)
 - Parking lot



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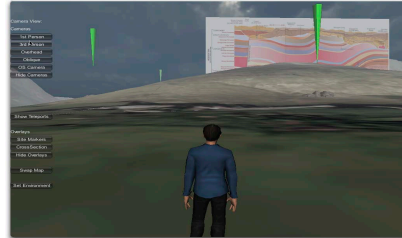
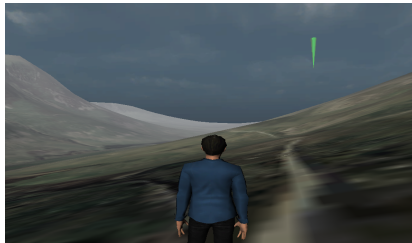


Geology fieldwork in a 3D environment



- authentic and interactive 3D simulations
- realism and high degree of fidelity
- virtual embodiment in the form of avatars
- visual and spatial experience not constrained by a 'flat' 2D user interface
- helps internalise the sense of exploration
- real-time interaction and collaboration

Opportunities for students and educators



- practice for and reflect upon real life field trips
- learn by self-exploration and in teams
- seeing and doing what you can't in the real world
- cutaways into a mountainside to see the geology beneath
- flying across the landscape
- explore, observe and gather data within a context, e.g. using a virtual microscope

Mandatory

- Hiking boots
- Hand lens
- Grain-size chart

Optional

- Waterproof clothing
- Sun hat
- Sunscreen
- Sunglasses
- Compass

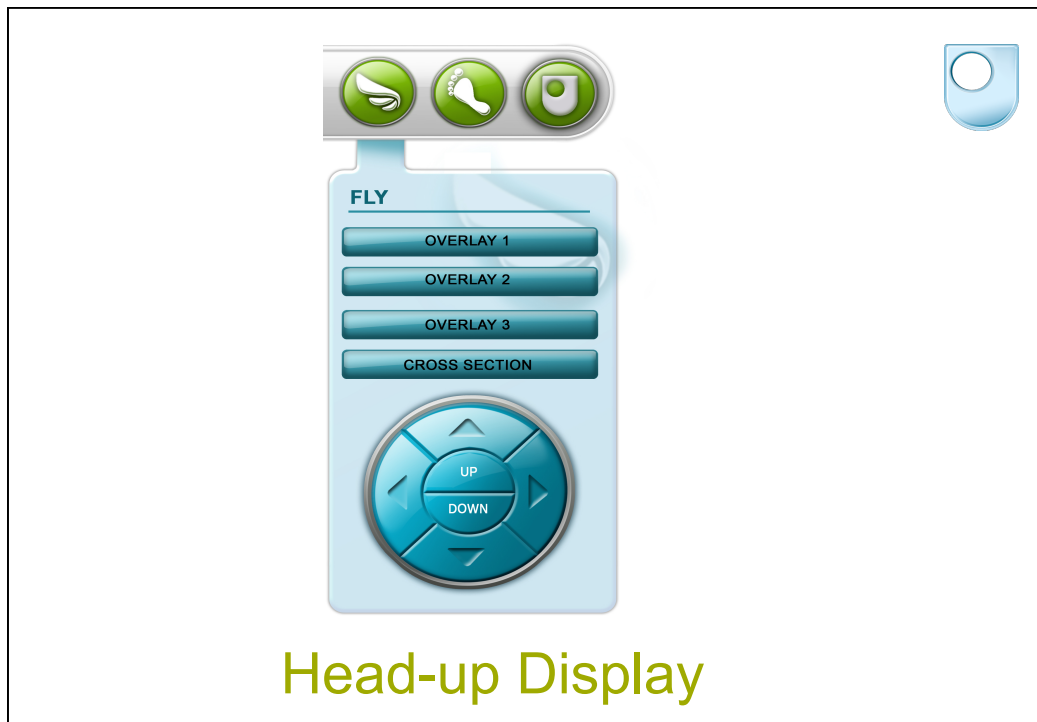
Inventory

'What other items would you choose to take on a real field excursion, and why? List them at the front of your notebook'

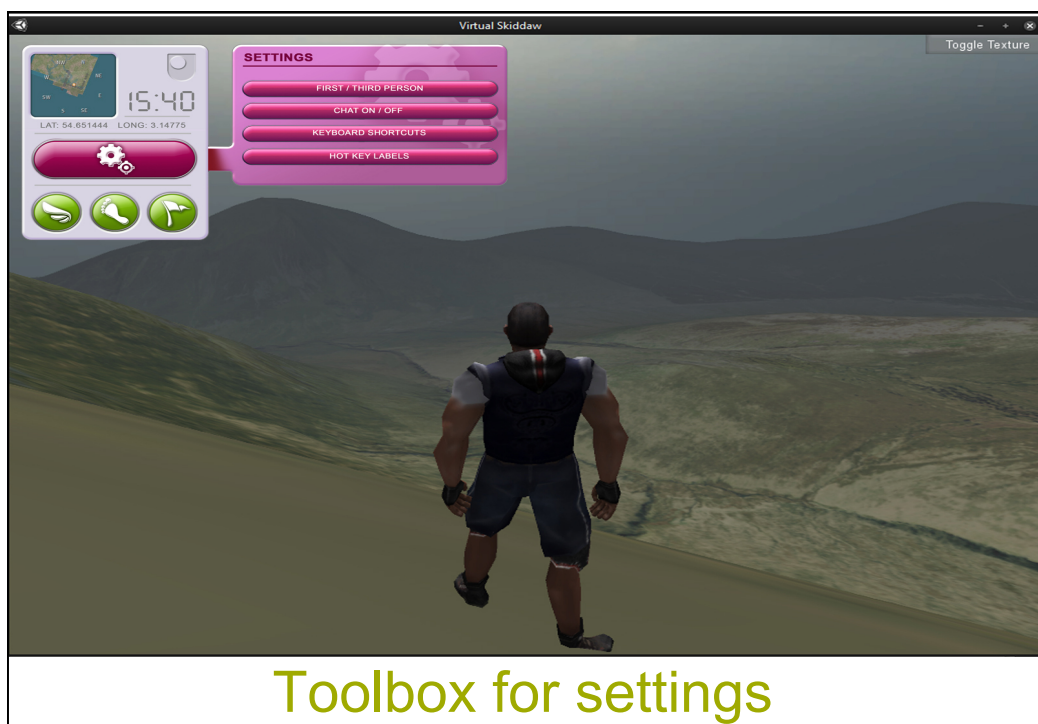
13°C

Kit Selection











Show Sketch points



Show Rocks



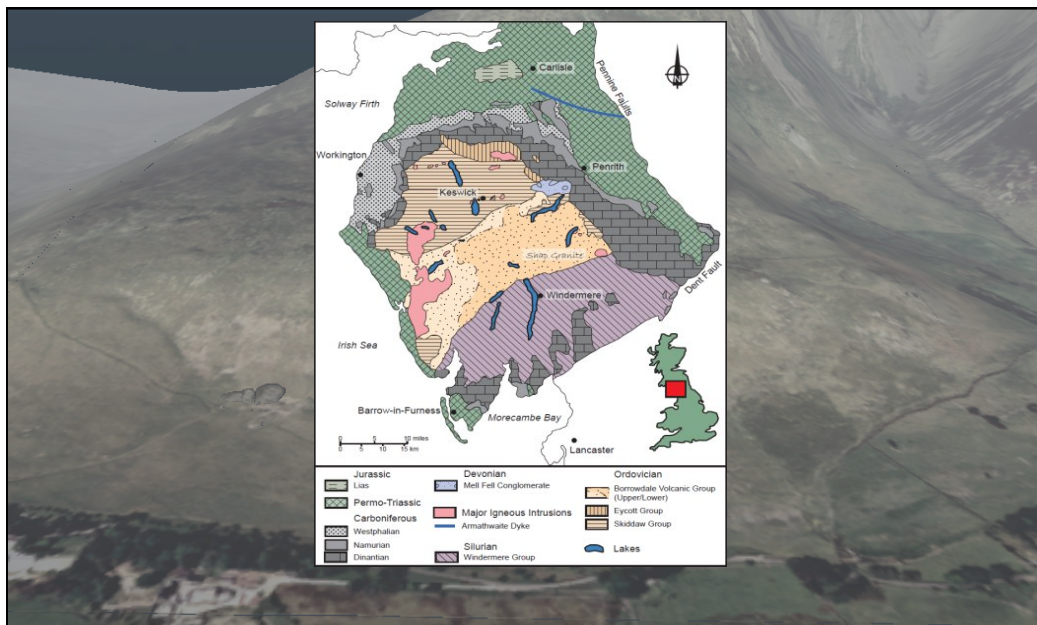
Just rock and rotation and microscope link

Ability to pick up “hand samples”. Hand sample will appear large scale, mid screen, and user will be able to view hand sample at higher level of detail and rotate/zoom – equivalent effect to a hand lens.

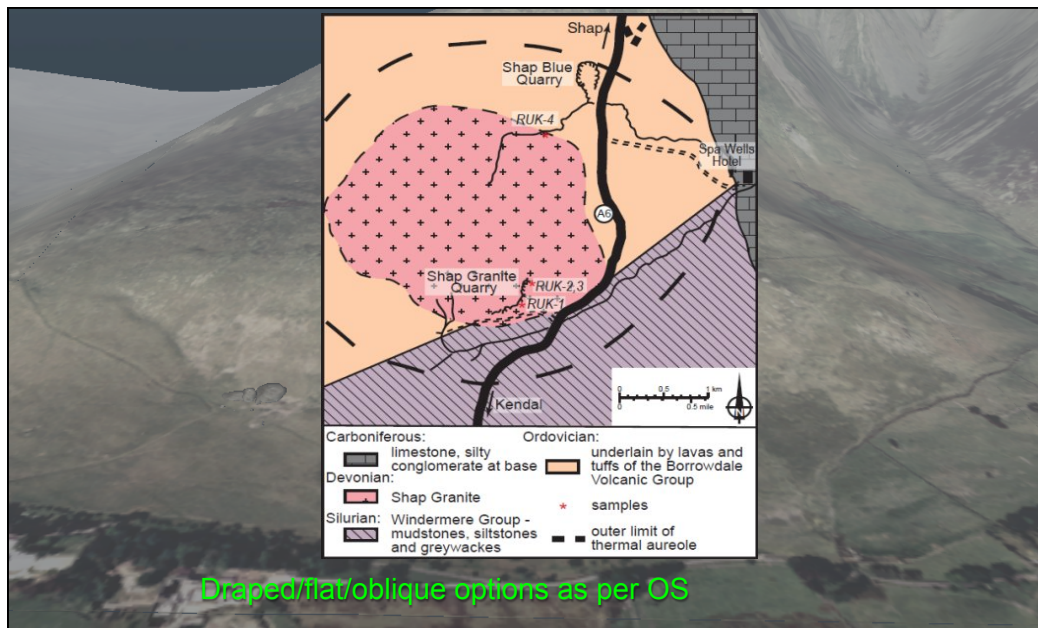
From a hand sample link to the Virtual Microscope by URL to browser



Pick up rock

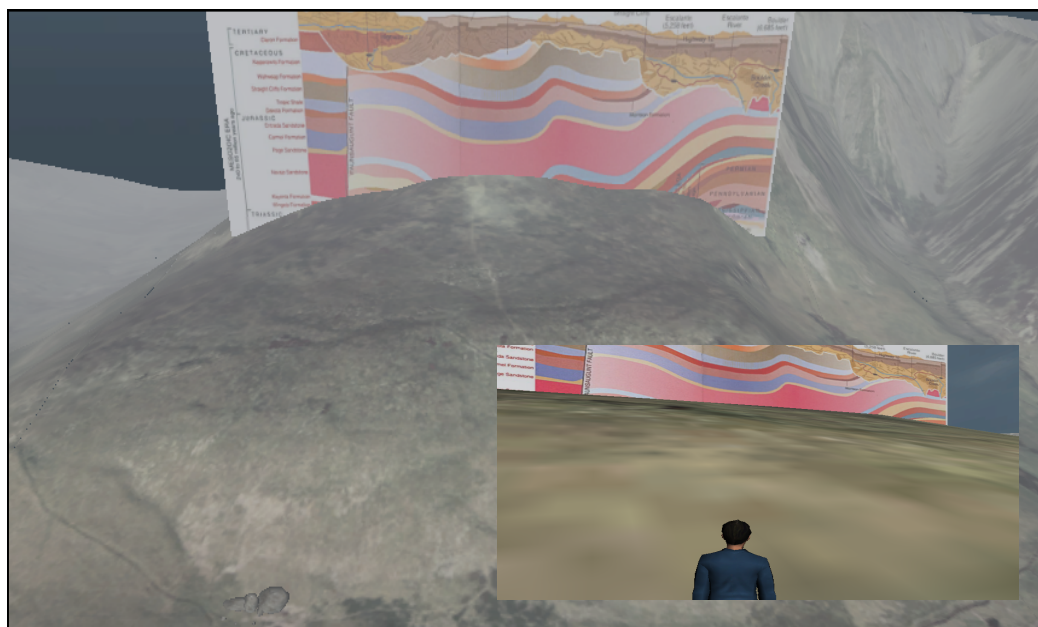


See Geology view



Draped/flat/oblique options as per OS

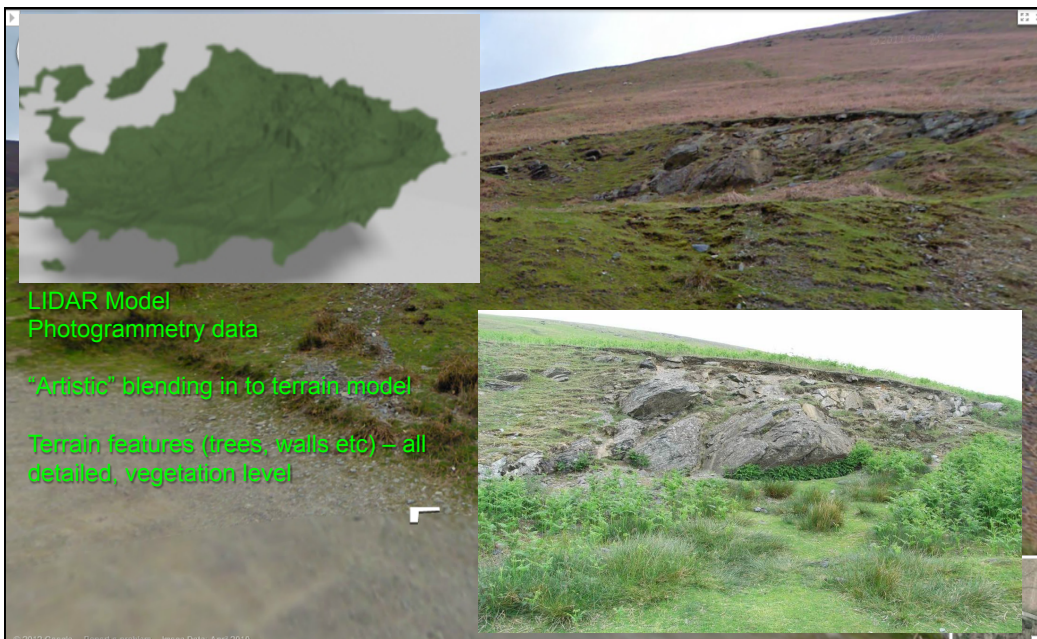
See Metamorphic view



Bring up slice



Arrive Site 2



Site Model